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(54) Multibit memory device

(57) A memory device (50) includes memory cells (130, 230) having re-writeable element (134, 234) and a write-once element (136, 236) in series with the re-writeable element (134, 234), the re-writeable element (134, 234) being programmable between a high resistance state and a low resistance state. The write-once element (136, 236) can be an anti-fuse element that is

programmable from a high resistance state to a low resistance state, or a fuse element that is programmable from a low resistance state to a high resistance state. The two possible states for the re-writeable element (134, 234) and the two possible states for the write-once element (136, 236) allow the memory cells (130, 230) to store four different bits.

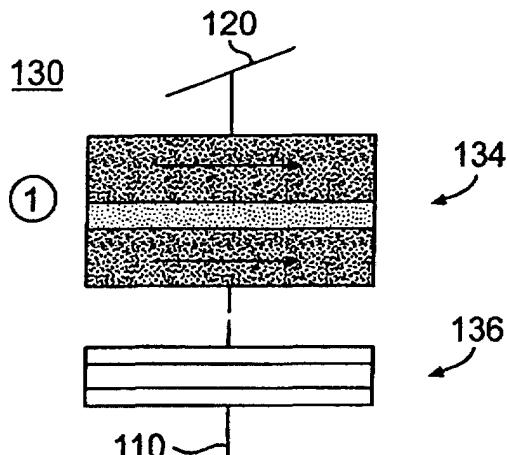


FIG. 5A

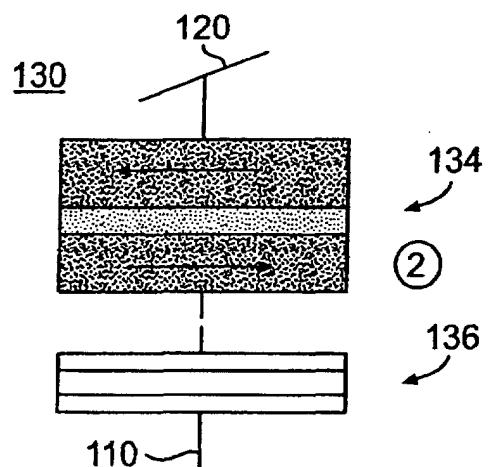


FIG. 5B

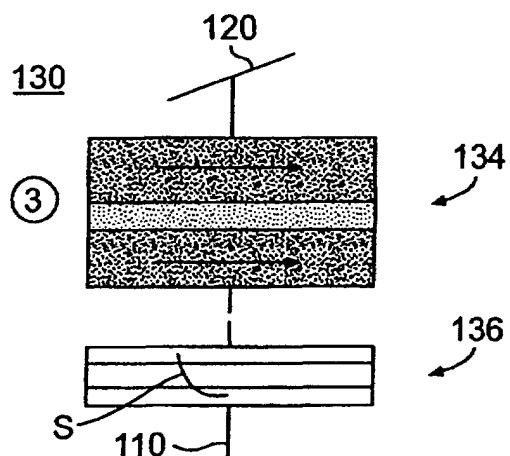


FIG. 5C

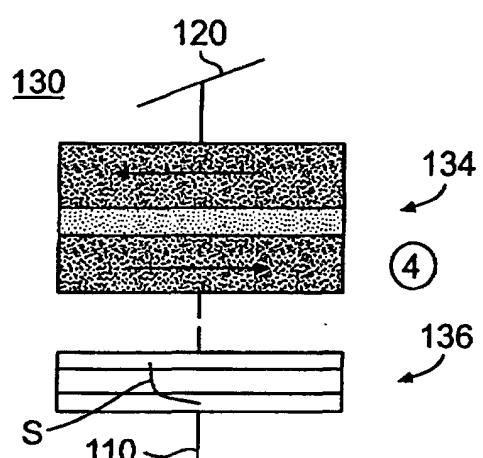


FIG. 5D



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EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 6 269 018 B1 (MONSMA DOUWE JOHANNES ET AL) 31 July 2001 (2001-07-31) * column 4, line 14 - line 33 * * column 7, line 20 - line 26 * * claims 18-25 * ----- US 5 930 164 A (ZHU THEODORE) 27 July 1999 (1999-07-27) * column 2, line 32 - column 3, line 12 * * column 4, line 36 - line 56 * * column 5, line 1 - line 23 * * figures 1,3,4 * ----- US 5 200 652 A (LEE ROGER R) 6 April 1993 (1993-04-06) * column 1, line 7 - column 2, line 65 * * figure 1 * ----- US 2001/021124 A1 (MORITA KIYOKUKI ET AL) 13 September 2001 (2001-09-13) * paragraph [0007] - paragraph [0011] * -----	1,2,8-10	G11C11/56 G11C11/15
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A		1-10	<p>TECHNICAL FIELDS SEARCHED (Int.Cl.7)</p> <p>G11C</p>
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search		Examiner
The Hague	11 May 2004		Colling, P
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X : particularly relevant if taken alone	T : theory or principle underlying the invention		
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P : intermediate document	& : member of the same patent family, corresponding document		

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ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 8092

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11-05-2004

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